World Water-from-Air Companies & Products Handbook: 2024 Second Edition

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DEDICATION

To everyone passionate about the value of the water-from-air industry
for helping to solve problems of water scarcity.

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PREFACE

The author compiled the information in this *Handbook*. It is reviewed and updated periodically. Comments, criticisms, and suggestions regarding the subject matter for future printings or editions are invited. Any errors or omissions in the contents should be brought to the attention of the author (atmoswater@gmail.com). In no way is the use of trade names intended to imply approval of any source or brand name over other similar ones not mentioned in the book. Product, company, or trade names should be presumed to be trademarks or service marks of their respective companies. Tables, figures, and photographs are by the author unless otherwise noted.

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1 INTRODUCTION

The purpose of this handbook is to guide the reader to the companies (manufacturers, distributors, and dealers) actively marketing and selling water-from air systems (atmospheric water generators or AWGs). On the internet you can find websites for about one hundred companies involved in the industry. Of these, 41 appear to be ready to sell and deliver their products and are included in this handbook. Some companies market only one product, while others market 15 models. Approximately 190 distinct AWG models exist currently. The total count of product line items listed in this handbook is 224 but this includes duplicates as offered by manufacturers' distributors or dealers.

Getting a grasp on this complex market, whether you are a seller or buyer is a daunting task. This handbook is a timesaving and money-saving tool for everyone needing to understand what products are available and from whom they can be purchased. Maps show the location of each company. Website addresses are given so you can learn more about the companies and products that interest you.

AWG companies were selected by the author. The listings are free of charge to ensure the independence of this handbook. Signs that a company is actively selling AWGs include case studies, social media posts, and a recent year copyright statement on the company website. Product information in this handbook was compiled from company websites. Product details were often scattered throughout these websites in text, Frequently Asked Questions (FAQ) sections, videos, manuals, and online brochures. The value of this handbook is that company and product details are organized in a consistent format (with some exceptions for page layout reasons) for ease in finding the data you need. Product photos are included for companies who kindly gave permission to use their photos. These photos are not to scale. Product sizes are given by dimensions and scale drawings. For smaller machines, plan, front elevation, and side elevation views are shown drawn to scale. For larger equipment, isometric dimensioned views are shown drawn to scale. Dimensions are from the product's webpage. A human figure, representing someone 69 inches tall (the average height of a North American male) is shown beside the scale drawings. If you are interested in a product photo for which a photo is not included in this book, simply visit the company's website. The user of this handbook is responsible for doing their own due diligence before making buying decisions. Wise advice from Roman times, *caveat emptor* (let the buyer beware), should still be heeded.

Most of the products listed here use mechanical dehumidifier technology. Exception are the desiccant dehumidifier type products by HurRainNanoTech Co., Ltd. and SOURCE® Global, PBC.

This handbook is more than a company and product guide. Chapter 2 explores how water scarcity creates a demand for technological solutions like AWGs. Two types of AWGs are discussed: mechanical and desiccant dehumidifiers. The atmospheric water vapour resource needed by AWGs is mapped and analyzed.

Chapter 3 offers the perspective that the documents about the United Nations Sustainable Development Goal 6: Water & Sanitation are the results of a global market survey, pointing to the locations on Earth where people would benefit greatly from the use of AWGs as water and hygiene services. Chapter 4 is the Companies & Products section.

Two associations relevant to the water-from-air industry (AHAM and ASSE) are listed in Chapter 5. Their products are standards publications relevant to water-from-air systems. Purchase them online from the organizations. Five foundations and groups focused on the AWG industry are listed in Chapter 6.

In the Appendices we discover 12 products have manuals online, 43 products have prices listed, and 32 products are available to purchase online. For ease of reference the Appendices include a list of *Abbreviations and Acronyms* and a list of *Units and Symbols*. Atmoswater Research and Canadian Dew Technologies Inc. hold some of the knowledge base for the water-from-air industry. To make this knowledge conveniently accessible the final two sections of this handbook catalogue their many digital goods available for purchase and download

2 WATER SCARCITY

Water scarcity creates a demand for innovations such as water-from-air technologies. These technologies are best used in places where there is absolute scarcity of liquid water. That is, there is not even enough polluted water that could be cleaned up by well-known conventional methods. Water-from-air machines are often called atmospheric water generators (AWGs). These machines can obtain liquid water from the water vapour that resides in the atmosphere. In tropical latitudes near sea level, every kilogram of air contains 10 to 20 grams of water vapour. AWGs use chilled coils or desiccants to capture the water vapour so it can be processed and stored as clean fresh water for drinking or other uses. Changing water from vapour to liquid is a phase change that consumes significant amounts of energy. Treating polluted liquid water to drinking water standards avoids this energy cost so often remains the preferred option if enough liquid water is available. Of course, there are reasons to accept the energy cost of AWGs. They are independent of water distribution systems so can fill chronic unaddressed gaps in water distribution. AWGs have a role in emergencies where water distribution is disrupted. AWGs can be used temporarily at public or private events where it would otherwise be difficult to provide enough water to people. Even in areas where there is a reliable public water supply some people like the peace of mind that comes with a private, secure source of clean water that is unaffected by issues such as groundwater pollution or lead contamination in water distribution systems. This section of the Handbook maps regions of water scarcity, discusses the two main AWG types, and maps regional abundance of the water-from-air resource.

Demand for AWGs

The search for an AWG is motivated usually by freshwater scarcity at a site. A global water stress map is shown in Figure 1. According to Luo, Young, & Reig (2015) water stress is defined as, "the ratio between total water withdrawals and available renewable surface water at a sub-catchment level". Their reasons for water stress include:

- Climate change,
- Economic development (sectors include agricultural, domestic, and industrial),
- Urbanization, and
- Population growth.

3 SUSTAINABLE DEVELOPMENT GOAL 6: WATER & SANITATION

The commercial potential of atmospheric water generators (AWGs) can be evaluated in the framework of the United Nations Sustainable Development Goals (SDGs). These global goals were set in 2015 by a unanimous vote in the UN General Assembly. The goals are to be met by 2030. The SDGs relevant to water resources make plain the urgent demand for specific products and services. They also state market segments and geographical regions that must be addressed to improve the quality of life for millions of people. In short, ***the SDG documents contain global market survey results, outlining concisely the big-picture problems that innovative products and services must help solve***.

As a reminder, and to put **the water-related SDG in context**, here is list of the seventeen SDGs (https://www.un.org/sustainabledevelopment/sustainable-development-goals/):

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. **Clean Water and Sanitation**
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life on Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals

Each goal has a list of targets. Indicators measure progress towards achieving targets. The SDG relevant to AWG design is Goal 6, Clean Water and Sanitation. The following Table 2 is my interpretation of how SDG 6 targets translate into insights about commercial potential for AWGs and the market segments to be addressed. These insights may influence design paths taken towards the final commercial versions of AWGs.

4 COMPANIES & PRODUCTS

This chapter is the heart of the handbook. First is a small-scale world map showing the global distribution of companies actively marketing and selling AWGs. Second is an alphabetical list of companies manufacturing or distributing AWGs. This is followed by sections devoted to each company. These sections start with a large-scale map showing the physical location of the company. Then each of the company's products are highlighted with a standardized specifications sheet and illustrations (plan & elevation or isometric) drawn to scale letting the reader appreciate the size of the AWG. Photos of the products are shown for companies that gave permission to use the photos.

Figure 8: Locations of active AWG companies.

AeroNero Solutions Private Limited

No: 12, 13, 14, 15 Sriram Avenue, 1st Street, Kottivakkam
Chennai 600041
Tamil Nadu
India

Founded	2019
Website	https://aeronero.life
Telephone	+1 800 419 4190
Email	hello@aeronero.com

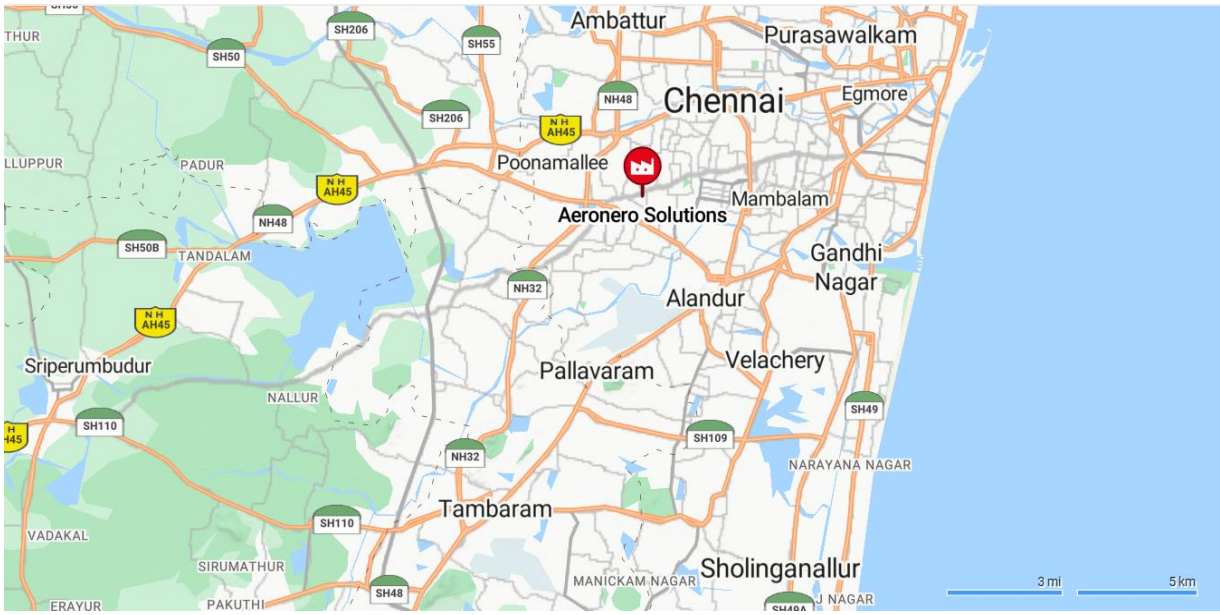


Photo courtesy of AeroNero Solutions Private Limited. Not scaled.

Nero

AeroNero Solutions Private Limited

Product identifier	Nero
Water production	
Claimed rate per 24h	10L 2.6gal
Rating conditions	30.0°C 80% RH
Standardized rate	na na
Standard conditions	na
Airflow	na
Air Filter	na
Fan or blower	na
Coil	na
Compressor energy	na
Compressor refrigerant	na
Drain pan material	na
Water tank capacity	7L 1.8gal
Municipal water mode	na
Water treatment	
Water pump	na
Filter array	
	1 sediment
	2 carbon
	3 minerals
Filter replacement notification	na
Ultra-violet disinfection system	na
Ozone disinfection system	no
Recirculation system	na
Ambient temperature water	na
Chilled water	na
Hot water	na
Hot water child lock option	na
Total water dispensing capacity	na
Immediate capacity	na
Faucets	1
Water dispensing rate	na
Drinking water guidelines	na
Energy Requirements	
Power supply	AC, 1 Phase, 110/220 V, 50/60 Hz
Power for water production	220W
Our estimated energy cost of product water (not chilled or heated)	0.53kWh/L

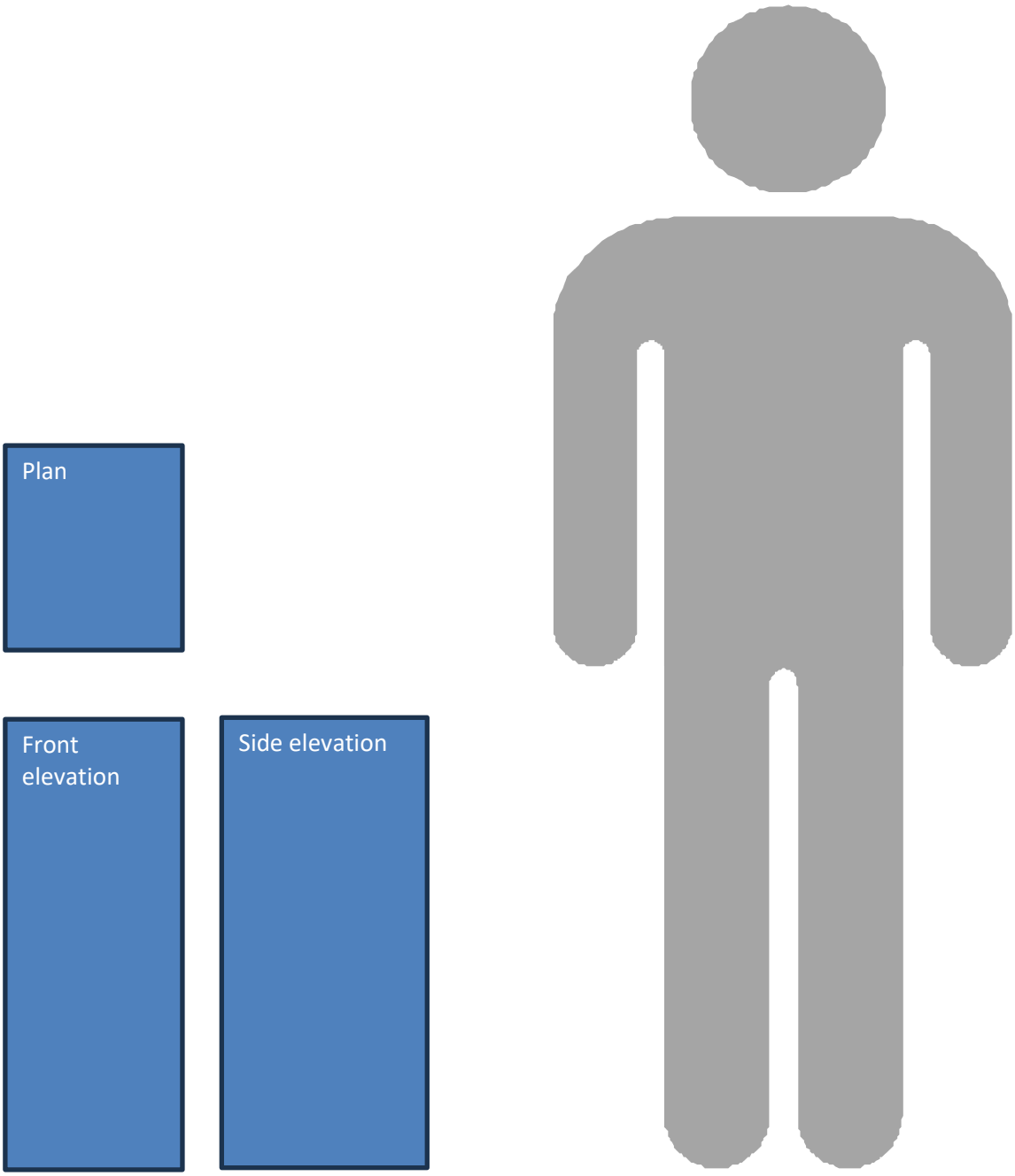
Nero

Operating Considerations			
Environmental Conditions	na	na	
Sound Power Levels	<36 dB(A)		
Physical data			
Dimensions (IP); W x D x H (inches)	10.2	11.8	26.0
Dimensions (SI): W x D x H (mm)	260	300	660
Equipment footprint (sq ft)	0.840		
Equipment footprint (sq m)	0.078		
Weight (IP)	29.8lb		
Weight (SI)	13.5kg		
Other information			
Warranty	1 year		
Materials	ABS body & SS water tank		
pH	na		
Intended use	Residential		
	Auto defrost at low temperatures		
	Auto On/Off		

na = information not available

Nero.
Product image courtesy of AeroNero Solutions Private Limited. Not scaled.

Nero



Scale drawing of outside dimensions. The human figure is 69 inches (1.75 m) tall.